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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,834	08/08/2006	Yasuhiro Isogai	023312-0117	6295

22428 7590 12/09/2009  
FOLEY AND LARDNER LLP  
SUITE 500  
3000 K STREET NW  
WASHINGTON, DC 20007

EXAMINER
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MCDOWELL, BRIAN E

ART UNIT	PAPER NUMBER
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1624

MAIL DATE	DELIVERY MODE
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12/09/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/553,834	<b>Applicant(s)</b> ISOGAI ET AL.	
	<b>Examiner</b> BRIAN MCDOWELL	<b>Art Unit</b> 1624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,3,5,7,8,11 and 13-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,7,8,11 and 13-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

/BEM/

### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/20/2009 has been entered.

#### ***Status of Claims***

Claims 1, 3, 5, 7, 8, 11, and 13-16 are pending in the instant application.

#### ***Status of Rejections***

#### ***35 USC § 103***

Applicant's amendments and arguments, see Remarks, filed 10/20/2009, with respect to the rejection set forth in the Final Office Action mailed 5/21/2009, has been fully considered and the rejection has been overcome.

#### ***New Objections and Rejections***

#### ***Claim Objections***

Claims 11 and 13-16 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

The recitation of an *intended use*, chemical activity or functional description of some "additional" property for a compound (or moiety/functionality attached to

a chemical core) or a composition containing same in a dependent or similar independent claim, must result in a tangible structural difference between the product of the independent claim and the product set forth in the dependent or similar independent claim. In the absence of said structural difference between the product of the independent claim and that of the dependent or similar independent claim, said claims are seen to be a substantial duplicate, and said recitation is not afforded critical weight and fails to further limit the product.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5, 7, 8, 11, and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roelant *et al.* (US Patent 5,998,128) in view of Botti *et al.* (WO 03/016330)-both references already cited of record.

Instant claims 1, 3, 5, 7, 8, 11, and 13-16 are drawn to porphyrin compounds linked to biotin groups via a linker; wherein said compounds may be used in hemoprotein labeling studies. Claim 8 is drawn to a method of preparing said porphyrin.

Roelant *et al.* disclosed several heme-like porphyrins (including the instantly claimed heme-b) that may serve as excellent binding substrates to certain entities of interest (where said entities may contain binding ligands such as biotin). The aforementioned porphyrin-entity complexes are useful in labeling, detecting, and

quantifying chemical/biological entities (e.g., proteins, see abstract and col. 2, lines 12-14). In particular, the document disclosed that protoporphyrins of formula II (i.e., heme b) is the prosthetic group for hemoglobin (e.g., the nonprotein component of hemoglobin, see col. 4 lines 9-14). Thus, one of ordinary skill would readily interpret from the latter that heme readily binds to hemoglobin and would serve as an ideal binding substrate for hemoproteins. However, the document did not mention that biotin groups could directly be linked to the starting porphyrin.

Botti *et al.* successfully showed that biotin-linked porphyrins may be readily obtained by directly linking porphyrins to biotin groups. Subsequently, the resulting porphyrins were used in the purification of proteins (see end of document, drawings section, page 4/9, Fig. 6a).

Thus, based on the teachings above by Roelant and the successful execution of implementing biotin-linked porphyrins in the purification and isolation process of proteins as shown by Botti; one of ordinary skill would have been motivated to obtain a biotin-linked porphyrin such as heme or a similar protoporphyrin thereof and successfully use said protoporphyrin in hemoprotein labeling studies. The biotin group and porphyrin moiety is critical to the claimed invention and not the linker "A", since said linker does not play an important role in the overall isolation process (avidin-biotin interaction or heme-hemoprotein interaction). Thus, linker "A" holds little patentable weight.

Claim 8 is drawn to a method of preparing a biotinyl linked porphyrin by coupling said porphyrin with a terminally aminated biotinyl group in the presence of a coupling agent. This method is described in the Roelant document, where DCC and

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hydroxybenzotriazole (see page 51, lines 20-30) are used as the coupling agents. Thus, this method of preparation would be considered obvious.

### ***Conclusion***

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN MCDOWELL whose telephone number is (571)270-5755. The examiner can normally be reached on Monday-Thursday 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. James O. Wilson can be reached 571-272-0661. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BRIAN MCDOWELL/  
Patent Examiner, Art Unit 1624

/James O. Wilson/  
Supervisory Patent Examiner, AU 1624